

PATENT ABSTRACTS OF JAPAN

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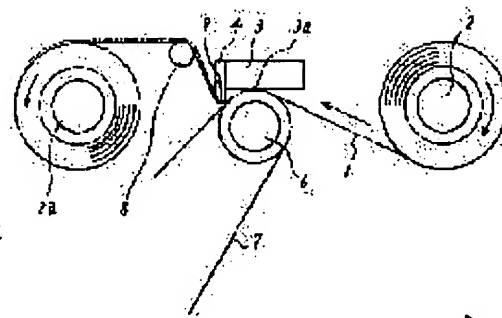
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(54) HEAT TRANSFER RECORDING DEVICE

(57)Abstract:

PURPOSE: To provide a heat transfer recording device in which folding creases are not formed even when the heating stretch of an ink sheet is increased by raising the heating temperature of a thermal head for improving the print density accuracy.

CONSTITUTION: A plate-shaped heater is set on a slit component 4 with which an ink sheet 1 after heat transfer is brought into contact, and an unheated section of the ink sheet 1 is reheated and stretched by a heating means to uniformize the tension of the ink sheet. Also, very fine projections are formed on an ink roll on which the ink sheet 1 is passed through after heat transfer, and very fine holes are formed on the unheated section of the ink sheet 1 by a boring means to weaken the tension of the unheated section and uniformize the tension of the ink sheet.



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CLAIMS

[Claim(s)]

[Claim 1] Thermal-transfer-recording equipment which comes to have a heating means to heat a base film side of an ink sheet after being prepared in a platen, a thermal head which opposite arrangement of this platen and attachment and detachment of is enabled, and carries out hot printing of the image to a form through an ink sheet, a conveyance means to convey the above-mentioned ink sheet, and the print downstream of the above-mentioned thermal head and dissociating with a form.

[Claim 2] Thermal-transfer-recording equipment according to claim 1 characterized by having prepared a slide member which is crooked in a thermal head in an ink sheet, and divides a form into it, and forming a heating means in a portion which touches an ink sheet of this slide member.

[Claim 3] Thermal-transfer-recording equipment which comes to have a platen, a thermal head which opposite arrangement of this platen and attachment and detachment of is enabled, and carries out hot printing of the image to a form through an ink sheet, a conveyance means to convey the above-mentioned ink sheet, and a puncher stage which forms micropore in an ink sheet after being prepared in the print downstream of the above-mentioned thermal head and dissociating with a form.

[Claim 4] Thermal-transfer-recording equipment according to claim 3 characterized by having prepared a slide member which is crooked in a thermal head in an ink sheet, and divides a form into it, and establishing a puncher stage in a portion which touches an ink sheet of this slide member.

[Claim 5] A puncher stage is thermal-transfer-recording equipment according to claim 4 characterized by constituting from a heating element which sets a predetermined gap crosswise [of an ink sheet], is prepared in it, and generates heat selectively.

[Claim 6] A puncher stage is thermal-transfer-recording equipment according to claim 3 characterized by constituting from an ink sheet roller with which a minute projection was formed in the perimeter.

[Claim 7] Thermal-transfer-recording equipment according to claim 6 characterized by containing a heating component on an ink sheet roller.

[Claim 8] Thermal-transfer-recording equipment according to claim 2 or 5 characterized by intervening a heat insulation member between a thermal head and a slide member.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the thermal-transfer-recording equipment which prevents Siwa by uneven heat expanding of the ink sheet at the time of the hot printing by the thermal head, and generating to which it breaks.

[0002]

[Description of the Prior Art] The important section side elevation and drawing 11 which show the conventional thermal-transfer-recording equipment with which drawing 10 was shown in JP,6-49044,U are an important section perspective diagram. In drawing, 1 rolls round the ink sheet with which an ink sheet and 2 are the rolling-up rolls of an ink sheet, and let out the supply roll of an ink sheet, and 2a from the supply roll 2. As for an ink sheet roller and 6, the slide member by which a thermal head and 3a were prepared in the heating element of a thermal head, and 4 was prepared for 3 in the ink sheet conveyance downstream of a thermal head 3, and 5 are [a platen and 7] forms.

[0003] such conventional thermal-transfer-recording equipment -- setting -- the ink sheet 1 and a form 7 -- between a thermal head 3 and platens 6 -- a pressure welding -- a platen 6 is rotated, ****(ing). It heats to this and coincidence with the electrical signal corresponding to a print image to a thermal head 3, and hot printing of the ink of the ink sheet 1 is carried out to a form 7. And a form 7 is conveyed according to frictional force with a platen 6. Moreover, after being crooked by the slide member 4 attached in the thermal head 3 and dissociating with a form 7, the ink sheet 1 which it let out is rolled round via the ink sheet roller 5, and is involved in roll 2a. At this time, the heating expanding section 10 by which heating expanding was carried out occurs on the ink sheet 1 with heating of heating element 3a of a thermal head 3. The heating expanding section 10 of this ink sheet is that in which the base film of the ink sheet 1 carried out partial expanding with heating, and will be in the condition of having slackened compared with a part for a non-heating unit.

[0004] Drawing 12 is the plan showing the condition before and behind heating of an ink sheet. The tension which shows tension with the weak ink sheet which generated A in the heating expanding section 10 of an ink sheet, and B are tension which shows the tension of the ink sheet generated in the left right end section of a non-elongated (un-heating) ink sheet. Moreover, C shows the ink sheet tension in front of the thermal head 3 corresponding to the tension B of the edge of an ink sheet, respectively. 22a and 22b are the sagging sections which arise in parallel, break to ink sheet tension just before touching heating element 3a mostly, and serve as Siwa. It is inserted in by the thermal head 3, and the sagging sections 22a and 22b became a poor imprint, and break, and 23 shows Siwa.

[0005] Next, actuation is explained. Since the portion which heating expanding was carried out at the time of the hot printing in a thermal head 3, and slack (extended) produced, and the portion which is not so are made, the ink sheet 1 in which pressure-welding conveyance is carried out by the platen 6 is rolled round, and the ununiformity of tension produces it between a roll 2 and a thermal head 3. This ununiformity is soon expanded to the tension ununiformity between a supply roll 2 and a thermal head 3. Although it concentrates on a non-elongated edge for the heating expanding section 10, and the former ununiformity is rolled round (conveyance) and is almost parallel to a direction, the non-elongated edge ink sheet tension B passes through a thermal head 3, and the latter ununiformity produces the ununiformity of tension between supply rolls 2, and produces the

uneven tension of the direction of slant equivalent to the ink sheet tension C in front of a thermal head 3.

[0006] The tension of this direction of slant will produce the sagging sections 22a and 22b in tension mostly at parallel. And the portion in which insertion Siwa 23 occurs in order for the ink sheet section by which heating expanding was carried out to follow on going on, to accumulate the sagging sections 22a and 22b, to insert in the ** sagging sections 22a and 22b soon and to pass a thermal head 3, and ink is not normally imprinted by the form 7 will arise, and the print itself will be spoiled.

[0007]

[Problem(s) to be Solved by the Invention] In equipment, the degree in a thermal head to heat is adjusted conventionally. Then, adjust the ununiformity of tension in a limit or In order to make the amount of sagging used as insertion Siwa into the inside of a limit, adjust the ink sheet tension in front of a thermal head, or Although adjusted the tension which rolls round an ink sheet, the bias of the tension in the sliding section, the configuration which eases inequality distribution, and frictional force were tuned finely or it was carrying out making an ink sheet roller thick inside, lengthening the amount of sagging of the ink sheet which carried out heating expanding, and carrying out the homogeneity of the tension etc. When heating temperature of a thermal head was made high for improvement in print concentration precision in any case, heating expanding became large, it inserted in with sagging, and there was a problem that Siwa was not solved.

[0008] This invention was made in order to solve the above problems, makes heating temperature of a thermal head high for improvement in print concentration precision, and aims at offering the thermal-transfer-recording equipment which inserts in even if heating expanding of an ink sheet increases, and Siwa does not generate.

[0009]

[Means for Solving the Problem] Thermal-transfer-recording equipment concerning this invention is formed in a platen, a thermal head which opposite arrangement of this platen and attachment and detachment of is enabled, and carries out hot printing of the image to a form through an ink sheet, a conveyance means to convey the above-mentioned ink sheet, and the print downstream of the above-mentioned thermal head, and is equipped with a heating means to heat a base film side of an ink sheet after dissociating with a form.

[0010] Moreover, a slide member which is crooked in a thermal head in an ink sheet, and divides a form into it is prepared, and a heating means is formed in a portion which touches an ink sheet of this slide member.

[0011] Moreover, it has a platen, a thermal head which opposite arrangement of this platen and attachment and detachment of is enabled, and carries out hot printing of the image to a form through an ink sheet, a conveyance means to convey the above-mentioned ink sheet, and a puncher stage which forms micropore in an ink sheet after being prepared in the print downstream of the above-mentioned thermal head and dissociating with a form.

[0012] Moreover, a slide member which is crooked in a thermal head in an ink sheet, and divides a form into it is prepared, and a puncher stage is established in a portion which touches an ink sheet of this slide member.

[0013] Furthermore, a puncher stage sets a predetermined gap crosswise [of an ink sheet], is established in it, and consists of heating elements which generate heat selectively.

[0014] A puncher stage consists of ink sheet rollers with which a minute projection was formed in the perimeter further again.

[0015] Moreover, a heating component is contained on an ink sheet roller.

[0016] Moreover, a heat insulation member is intervened between a thermal head and a slide member.

[0017]

[Function] In this invention, the ink sheet after hot printing is heated with a heating means, heat expanding of the non-heated ink sheet section is carried out, and the tension ununiformity of an ink sheet is abolished.

[0018] Moreover, it heats with the heating means formed in the slide member, heat expanding of the non-heated ink sheet section is carried out, and the tension ununiformity of an ink sheet is abolished.

[0019] Moreover, a very small hole is formed for the ink sheet after hot printing by the puncher stage, the tension of the non-heated ink sheet section is weakened, and the tension ununiformity of an ink sheet is abolished.

[0020] Moreover, a very small hole is formed by the puncher stage which prepared the ink sheet after hot printing in the slide member, the tension of the non-heated ink sheet section is weakened, and the tension ununiformity of an ink sheet is abolished.

[0021] Moreover, the ink sheet after hot printing is dissolved with the heating element which generates heat selectively, a very small hole is formed, the tension of the non-heated ink sheet section is weakened, and the tension ununiformity of an ink sheet is abolished.

[0022] Moreover, a very small hole is formed for the ink sheet after hot printing by the very small projection of an ink sheet roller, the tension of the non-heated ink sheet section is weakened, and the tension ununiformity of an ink sheet is abolished.

[0023] Moreover, a very small hole is formed, and the tension of the non-heated ink sheet section is weakened, carrying out heating dissolution of the ink sheet after hot printing by the very small projection of an ink sheet roller, and heating expanding of the non-heated ink sheet section is carried out, and the tension ununiformity of an ink sheet is abolished.

[0024] Moreover, heat conduction from a heating means to a thermal head is prevented by the heat insulation member.

[0025]

[Example]

Example 1. drawing 1 and drawing 2 are the important section side elevations of the thermal-transfer-recording equipment which all show the example 1 of this invention, and the condition that, as for drawing 2, the thermal head opened from the platen the condition that, as for drawing 1, the thermal head touched the platen is shown. Drawing 3 is the plan showing the condition before and behind heating of the ink sheet in an example 1. In drawing, 1 rolls round the ink sheet with which an ink sheet and 2 are the rolling-up rolls of an ink sheet, and let out the supply roll of an ink sheet, and 2a from the supply roll 2. The slide member which a thermal head and 3a are prepared in the heating element of a thermal head, 4 is prepared in the ink sheet conveyance downstream of a thermal head 3, and 3 contacts the base film side of the ink sheet 1, and 5 are an ink sheet roller and a tabular heater as a heating means by which 6 was embedded to the part to which a platen and 7 touch a form and 9 touches INKUSHI-TO 1 of a slide member 4, and it consists of ink sheets 1 broadly. INKUSHI-Urabe by whom heating expanding of 10 was done at the tabular heater 9, INKUSHI-Urabe by whom heating expanding of 11 was carried out by the thermal head 3 at the time of a print, and 12 and 13 show the uniform tension generated on the ink sheet 1.

[0026] Next, the print actuation is explained. the ink sheet 1 and a form 7 -- between a thermal head 3 and platens 6 -- a pressure welding -- a platen 6 is rotated, ****(ing). It heats to this and coincidence with the electrical signal corresponding to a print image to a thermal head 3, and hot printing of the ink of the ink sheet 1 is carried out to a form 7. At this time, the degree of superheat to INKUSHI-TO 1 changes selectively with images with the existence of an image, the amount of imprint ink, and concentration. Therefore, as for INKUSHI-TO 1, selectively, elongatedness differs with heat and INKUSHI-Urabe 11 to whom the portion which is not elongated existed in the same field can do it. However, INKUSHI-TO 1 is conveyed further, is crooked by the slide member 4, and is separated from a form 7. Since the portion to which a slide member 4 touches the ink sheet 1 at this time is heated by the degree which the base film of INKUSHI-TO 1 softens at the tabular heater 9, in this flection, mainly the portion by which INKUSHI-TO 1 is not elongated with heating of a thermal head 3 contacts the tabular heater 9 of a slide member 4, and is elongated, and, as for INKUSHI-TO 1, the whole surface is elongated by homogeneity.

[0027] Thus, the uniform tension 12 will occur in INKUSHI-TO 1 by carrying out heating expanding of INKUSHI-TO which carried out chisel expanding in part with heating of a thermal head at the time of a print again, and generating of Siwa can be prevented. In addition, where a thermal head 3 is opened from a platen 6, a slide member 4 and INKUSHI-TO 1 are in the location which does not contact, and INKUSHI-TO 1 is not unnecessarily heated at the time of INKUSHI-TO conveyances other than print actuation.

[0028] The important section side elevation of the thermal-transfer-recording equipment which example 2. drawing 4 shows the example 2 of this invention, and drawing 5 are the plans showing the condition before and behind heating of the ink sheet in an example 2. In drawing, 1-7, and 9-11 are the same as that of the thing of explanation in the above-mentioned example 1. 8 is prepared in the portion which INKUSHI-TO 1 of a slide member 4 touches, is the thermal head or punch heater as a puncher stage, and is formed more broadly than the ink sheet 1. This thermal head 8 ends micropore 10c as energized an electrical signal to the heating element prepared crosswise [of INKUSHI-TO] at the predetermined gap, formed a heating element into instant high

temperature, carried out the dissolution punch of INKUSHI-TO 1 and shown in drawing 5 .

[0029] According to this example, the portion which the non-elongated portion most often contacted the thermal head 8, and INKUSHI-TO 1 after hot printing was carried out carried out heat expanding at the time of hot printing, and had is conveyed so that a thermal head 8 may be touched with some opening. And heating dissolution is carried out by energizing with a time interval suitable during conveyance of INKUSHI-TO 1, micropore 10c is broken into a non-elongated portion, the reinforcement of this portion is weakened, distributed equalization of the tension is carried out, and generating of Siwa is prevented. Since the part where tension is stronger although heat expanding is carried out and the flabby portion does not have direct heating by the opening is close to a thermal head 8, although INKUSHI-TO 1 is a few in response to the heat of a heating element, since it elongates, distributed equalization of tension improves further.

[0030] moreover, the control maintenance in the condition of preventing concentration of micropore 10c to the part of INKUSHI-TO 1a, or making a resistance-welding-time gap adjustable as a heating element is chosen, boiled and energized, and being the hardest to generate Siwa is easy.

[0031] Example 3. drawing 6 is the important section side elevation of the thermal-transfer-recording equipment in which the example 3 of this invention is shown. In drawing, 1-11 are the same as that of the thing of explanation in the above-mentioned example 1 and an example 2. 14 is the heat insulation member which intervened between the slide members 4 and thermal heads 3 in which the thermal head 8 or the tabular heater 9 was formed. Since the heat of a thermal head 8 or the tabular heater 9 does not conduct to a thermal head 3 by having made the heat insulation member 14 intervene according to this example, the thermal adverse effect to a thermal head 3 is prevented in the case of a print.

[0032] The important section side elevation of the thermal-transfer-recording equipment which example 4. drawing 7 shows the example 4 of this invention, and drawing 8 are the plans showing the condition before and behind heating of the ink sheet in an example 4. In drawing, 1 rolls round the ink sheet with which an ink sheet and 2 are the rolling-up rolls of an ink sheet, and let out the supply roll of an ink sheet, and 2a from the supply roll 2. The slide member which a thermal head and 3a are prepared in the heating element of a thermal head, 4 is prepared in the ink sheet conveyance downstream of a thermal head 3, and 3 contacts the base film side of the ink sheet 1, and 50 are the ink sheet rollers as a puncher stage, and minute projection 50a protrudes on the perimeter. A form and 10a are the micropores by which 6 was punched at the platen and 7 was punched at the ink sheet 1.

[0033] Next, print actuation is explained. the ink sheet 1 and a form 7 -- between a thermal head 3 and platens 6 -- a pressure welding -- a platen 6 is rotated, ****(ing). It heats to this and coincidence with the electrical signal corresponding to a print image to a thermal head 3, and hot printing of the ink of the ink sheet 1 is carried out to a form 7. At this time, to INKUSHI-TO 1, print heat is applied by the thermal head 3, and INKUSHI-Urabe 11 by whom elongated INKUSHI-TO 1 in part and print expanding was done appears in it. however, INKUSHI-TO 1 is conveyed further -- having -- a slide member 4 -- passing -- ink C -- fatty tuna - RA 50 -- reaching -- ink C -- fatty tuna -- micropore 10a ends by minute projection 50a with the revolution of - RA 50. To the part which this minute hole 10a ended to the part where the tension of INKUSHI-TO 1 is large, i.e., the place which is not elongated by un-heating, and heating expanding was carried out and slackened, the contact to INKUSHI-TO 1 of minute projection 50a hardly opens micropore 10a few. Since, as for the portion into which micropore 10a ended, the reinforcement of INKUSHI-TO 1 becomes weak and tension is distributed by expanding of this portion, it becomes INKUSHI-TO to which the whole surface was extended to homogeneity.

[0034] Thus, micropore 10a is broken to the part where the tension of INKUSHI-TO 1 is large, by distributing tension, the uniform tension 12 will occur in INKUSHI-TO 1, and generating of Siwa can be prevented.

[0035] Example 5. drawing 9 is the important section side elevation of the thermal-transfer-recording equipment in which the example 4 of this invention is shown. In drawing, 1-7 are the same as that of the thing of explanation in the above-mentioned example 4. 50 is an ink sheet roller as a puncher stage, and minute projection 50a protrudes on the perimeter. 50b is a cylindrical heater as a heating component included in the interior of the INKUSHI-troller 50, and in case it ends micropore 10b in INKUSHI-TO 1, it ends micropore 10b as heated minute projection 50a by cylindrical heater 50b and shown in drawing 8 .

[0036] Thus, by carrying out heating softening of INKUSHI-TO 1, and breaking micropore 10b, the crack initiation of the micropore 10b section is prevented, and cutting of INKUSHI-TO 1 is lost. Moreover, since

heating expanding of INKUSHI-TO 1 self is added in case the reinforcement of the non-elongated portion of INKUSHI-TO 1 by micropore 10b is weakened and tension distributes, compared with the above-mentioned example 4, distribution of tension and equalization are made more, and an effect is in generating prevention of Siwa.

[0037]

[Effect of the Invention] Since this invention is constituted as explained above, it does an effect as taken below so.

[0038] Since heat expanding of the non-heated ink sheet section is carried out by establishing a heating means to heat the base film side of the ink sheet after separating into the print downstream of a thermal head with the form, the tension ununiformity of an ink sheet is lost and insertion Siwa of INKUSHI-TO can be prevented.

[0039] Moreover, since the heating means was formed in the portion which touches the ink sheet of the slide member which is crooked in a thermal head in an ink sheet, and divides a form into it and heat expanding of the non-heated ink sheet section is carried out at the latest of a print, the tension ununiformity of an ink sheet is lost and insertion Siwa of INKUSHI-TO can be prevented.

[0040] Moreover, since the puncher stage which forms micropore in the ink sheet after separating into the print downstream of a thermal head with the form was prepared and tension relaxation of the non-heated ink sheet section is carried out by micropore, the tension ununiformity of an ink sheet is lost and insertion Siwa of INKUSHI-TO can be prevented.

[0041] Moreover, since the slide member which is crooked in a thermal head in an ink sheet, and divides a form into it was prepared, the puncher stage was established in the portion which touches the ink sheet of this slide member and tension relaxation of the non-heated ink sheet section is carried out by micropore at the latest of a print, the tension ununiformity of an ink sheet is lost and insertion Siwa of INKUSHI-TO can be prevented.

[0042] Moreover, since it constituted from a heating element which sets a predetermined gap crosswise [of an ink sheet], is prepared in it as a puncher stage, and generates heat selectively and tension relaxation of the non-heated ink sheet section is carried out by the micropore formed in the pattern of arbitration, the tension ununiformity of an ink sheet is lost and insertion Siwa of INKUSHI-TO can be prevented.

[0043] Moreover, since it constituted from an ink sheet roller with which the minute projection was formed in the perimeter as a puncher stage and tension relaxation of the non-heated ink sheet section is carried out by micropore, the tension ununiformity of an ink sheet is lost and insertion Siwa of INKUSHI-TO can be prevented.

[0044] Moreover, since the heating component was contained on the ink sheet roller and tension relaxation of the non-heated ink sheet section is carried out by heat expanding with micropore, the tension ununiformity of an ink sheet is lost and insertion Siwa of INKUSHI-TO can be prevented.

[0045] Moreover, since the heat insulation member was intervened between the thermal head and the slide member, the thermal adverse effect to a print can be prevented and a high-definition print is obtained.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The thermal head of the thermal-transfer-recording equipment concerning the example 1 of this invention is the important section side elevation showing the condition of having touched the platen.

[Drawing 2] The thermal head of the thermal-transfer-recording equipment concerning the example 1 of this invention is the important section side elevation showing the condition of having opened from the platen.

[Drawing 3] It is the plan showing the condition before and behind heating of the ink sheet in the example 1 of this invention.

[Drawing 4] It is the important section side elevation of the thermal-transfer-recording equipment in which the example 2 of this invention is shown.

[Drawing 5] It is the plan showing the condition before and behind heating of INKUSHI-TO in the example 2 of this invention.

[Drawing 6] It is the important section side elevation of the thermal-transfer-recording equipment in which the example 3 of this invention is shown.

[Drawing 7] It is the important section side elevation of the thermal-transfer-recording equipment in which the example 4 of this invention is shown.

[Drawing 8] It is the plan showing the condition before and behind heating of INKUSHI-TO in the example 4 of this invention.

[Drawing 9] It is the important section side elevation of the thermal-transfer-recording equipment in which the example 5 of this invention is shown.

[Drawing 10] It is the important section side elevation showing conventional thermal-transfer-recording equipment.

[Drawing 11] It is the important section perspective diagram showing conventional thermal-transfer-recording equipment.

[Drawing 12] It is the plan showing the condition before and behind heating of the ink sheet in equipment conventionally.

[Description of Notations]

1 INKUSHI-TO 3 Thermal Head 3a Heating Element

4 Slide Member 50 Ink C -- Fatty Tuna - RA 50a Minute Projection

50b Cylindrical heater 6 Platen 7 Form

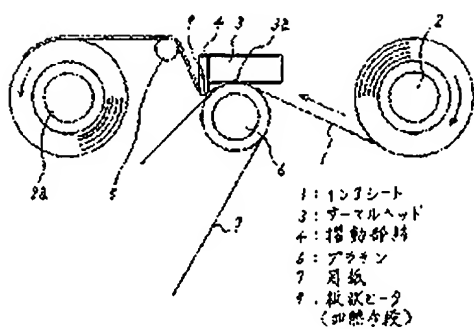
8 Thermal Head 9 Tabular Heater 14 Heat Insulation Member

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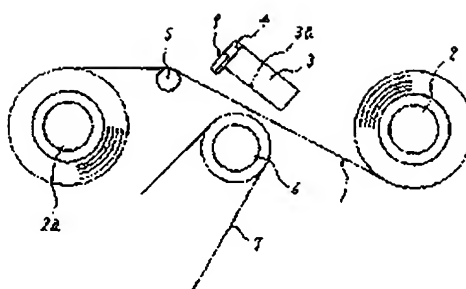
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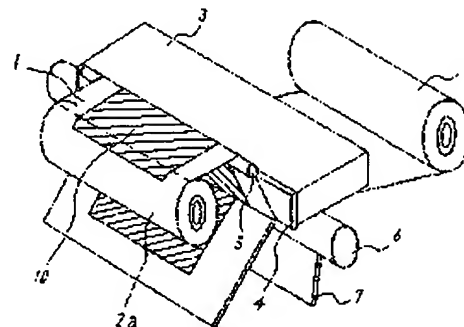
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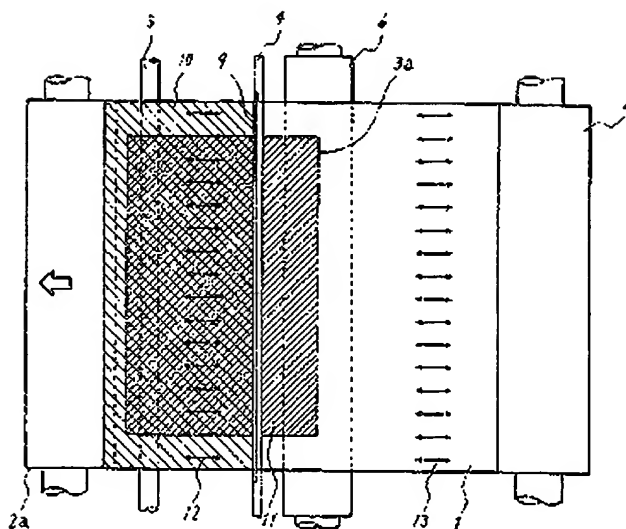
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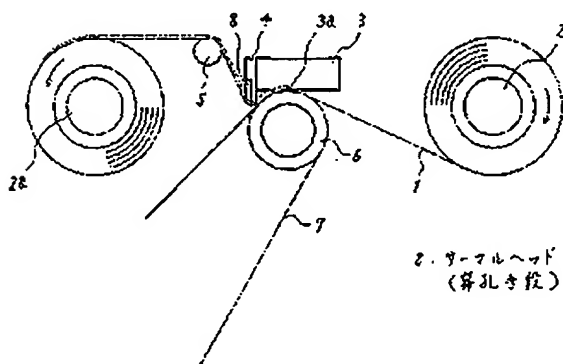
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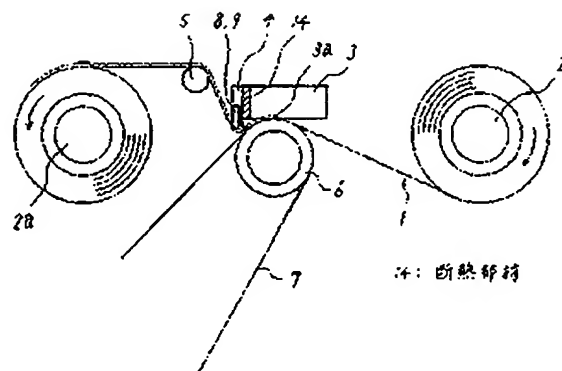
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【図4】



【図6】

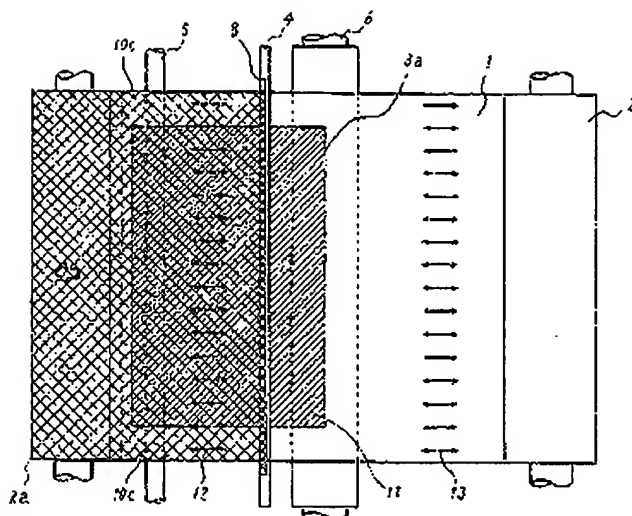


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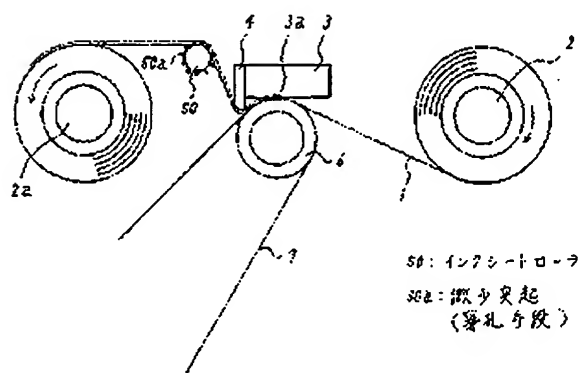
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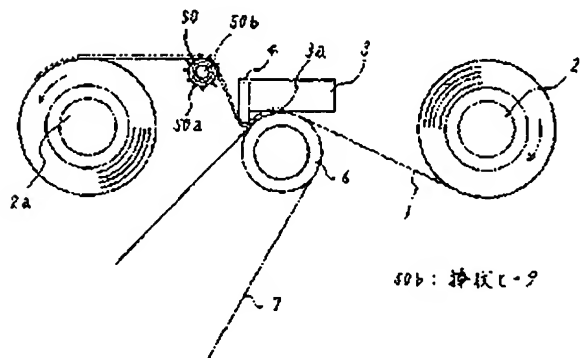
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【図7】



【図9】

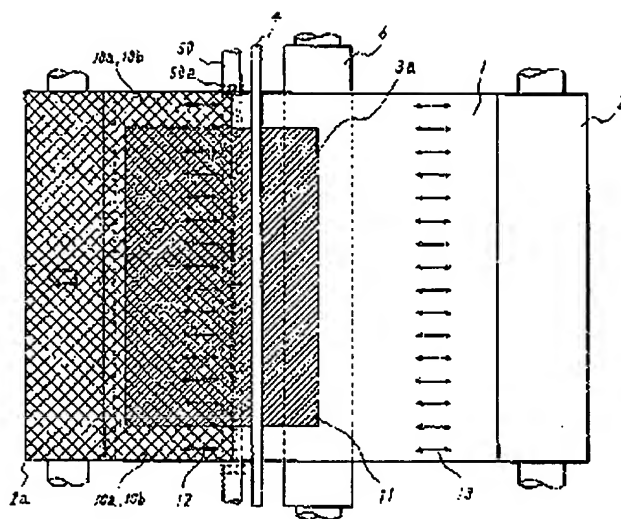


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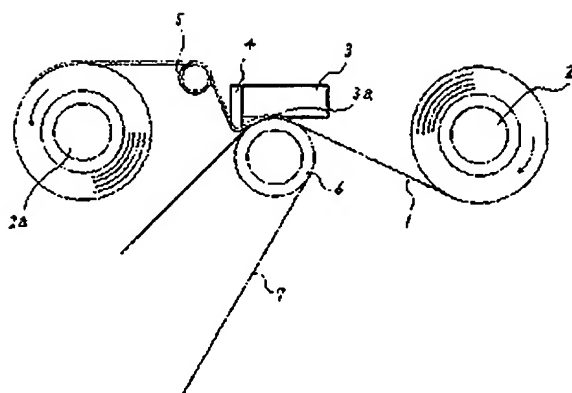
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【図8】



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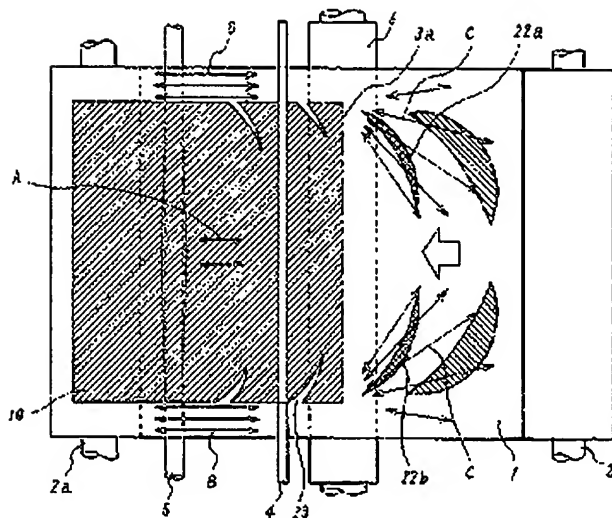
【図10】



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【図12】



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